

Determination of Organic Matter Degradability of Urea Treated Canola Straw Using Nylon Bag Technique

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Abstract: This experiment was conducted to determination of organic matter degradability of urea treated canola straw using nylon bag techniques. Three rumen fistulaed Gehzel sheep were used. Experimental group were: untreated canola straw (control) and 4% urea treated straw 4 g samples of each treatment were incubated at time intervals (0, 2, 4, 8, 16, 24, 48, 96) h in the rumen. The results showed that organic matter degradability for untreated straw lower than treated straw and soluble fraction (a) decreased and slowly degradaed fraction (b) from 25.54-38.52%. In an overall conclusion treated canola straw by urea lead to increasing degradability for ruminants.

Key words: Canola straw, urea, nylon bag, organic matter, fraction, techniques

INTRODUCTION

Fibrous residues, most of the waste produced agricultural products are considered. This by products useage in each region have different purposes, however is important the use of the fibrous residues in animals feed is particularly in tropical countries of the world because most agricultural land under cultivation for human food production goal. Moreover, animals fed with this by products annually produced of many manure an important role in agricultural soils fertilization. So understanding of plant by product sources used in animal feed an effective step in tropical countries husbandry (Cheesson and Orskov, 1984).

Canola Isa oil plant of the family and gender *Brassica campestris*. Considering the large volume of the oilseed crop, the straw will yield much (Zeb, 1998). According to the canola straw chemical composition comparable with wheat and barley straw. The objective of this study was to determine nutritive value canola straw treating using urea with nylon bag technique.

MATERIALS AND METHODS

Samples and treatments: Straw samples were obtained from commercial sources Parsabad region of Iran. With sufficient water with 4% urea was added to straw and kept until 45 day (Broderick and Radlof, 2004). The remainder of each sample was ground to pass a 5 mm screen for the ruminal *in situ* studying.

Animal and diets: Three ruminal cannulate Gehzel ram weighing approximately 55 kg were placed in individual pens. Sheep's were fed ration containing concentrate and alfalfa hay, diets three daily at 08:00, 12:30 and 20:00 h. Treatment includeing:

- Untreated straw
- Treated straw with 4% urea (Table 1)

***In situ* evaluation of organic matter:** Nylon bag technique was used to measure disappearance in the rumen of untreated and treated straw. Nylon bags (45 µm pore size; 10 cm×15 cm bag size) containing 5g of SBM samples were incubated in the rumen of each sheep. In a completely randomized design with two treatments and three replications for each animal were performed, 4 bags of each type of treated straw were removed after 2, 4, 8, 16, 24, 48, 72 and 96 h of incubation in the rumen. Then individual bags with contents were washed in running tap water until the bags were free of rumen content. To reach constant weight, bags were dried at 60°C for 48 h. The solubility or washing loss was determined by soaking samples of each material in water at 37-40°C for 1h followed by the washing procedure above. Digestion kinetics of OM was determined according to the equation by Orskov and McDonald (1979).

Table 1: Chemical composition of treated and untreated straw

Treatments	DM	CP	ADF	NDF	EE	Ash
Control	86.89	2.80	58.8	79.2	3.90	2.40
4% urea treated	59.51	7.75	60.6	78.8	3.90	2.84

Table 2: The rumen degradation characteristics of organic matter treated and untreated canola straw

Treatments	Time of incubation									a	b
	0	2	4	8	16	24	48	72	96		
Control	0.8600	1.0060	3.2300	4.0800	13.3000	16.5100	19.9400	23.5800	25.0200	0.4210	25.5400
4% urea treated	2.2100	2.7900	4.0400	10.9500	20.1700	25.9030	34.8100	36.6800	37.3400	0.1700	38.5200
p-value	0.0439	0.0062	0.0159	0.0016	0.0005	0.0013	0.0004	0.0010	<.0001	0.2172	0.0002

Statistical analyses: Data were analyzed in a complete randomized design and means compared with t-test.

RESULTS AND DISCUSSION

Degradation results in Table 2 is shown. According to Table 2 results show that degradation of organic matter of control group in different incubation time much less than experimental group include straw treating with urea. Soluble fraction from 0.86-2.21% in the control group and with increasing trend has continued in the 16 h incubation from 13.3-20.17% and finally reached in 96 h of incubation time reached from 25.02-37.34%.

Water soluble fraction with a decreasing trend in the control group from 0.421-0.17% and results show that treating with urea influenced a fraction. Slowly degraded fraction (b) affected to treating and from 25.54-38.52%. Urea breaking cell wall and provide nitrogen requirements for rumen microorganisms and their growth stimulation could increase digestibility of fibrous materials. Also reduced lag time in straw degradation.

CONCLUSION

According to the results can be stated that treating canola straw with urea increased rumen degradability and therefore could replacing in the ruminant diet.

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